

REMARKS

Claims 1-26 are all the claims pending in the application. All the claims stand presently rejected under 35 U.S.C. § 112, first paragraph. In addition, all the claims stand presently rejected under 35 U.S.C. § 103(a) as being unpatentable over Marks (US Patent No. 6,025,847) in view of Asar (US Patent No. 6,477,266), and further in view of Crandall (US Patent No. 5,552,984).

The Rejection of Claims 1-26 under 35 U.S.C. § 112, first paragraph

A brief summary of illustrative embodiments of the present invention can be found on pages 5 and 6 of Applicants' Amendment filed April 3, 2003.

Independent claim 1 is directed to a device for generating a virtual installation model as an image of a real installation, wherein the device comprises, among other things, an evaluation-and-control-unit for comparing information data of installation components with picture data of the real installation, for identifying identified components in the picture data as respective ones of the installation components, for deriving hypotheses regarding the identified components in the picture data, and for generating the respective identified ones of the installation components in the virtual installation model.

Independent claim 13 is directed to a method for generating a virtual installation model as an image of a real installation, wherein the method comprises, among other things, comparing information data of installation components of a component library with picture data of the real installation to identify at least one of the installation components in the picture data as an identified installation component.

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Independent claim 25 is directed to a device for generating a virtual model of a facility, wherein the device comprises, among other things, a processing unit to compare components of the facility in picture data with predefined representations of the components of the facility in order to identify identified components as respective ones of the components of the facility.

In the previous Office Action dated December 4, 2002, all the currently pending claims 1-26 were rejected under 35 U.S.C. § 112, first paragraph. Applicants filed arguments on April 3, 2003, addressing the § 112 rejections. However, in the "Response to Arguments" section on pages 2 and 3 of the present Office Action, the Examiner states that Applicants' arguments are not persuasive. In particular, on page 2 of the present Office Action, the Examiner raises a number of specific questions regarding the nature of the geometric assignment and the nature of the geometric elements.

Further, in item 3 of the present Office Action, the Examiner states that the specification does not disclose an algorithm, technique, or process for comparing component information data with real picture data, or an algorithm or technique to identify the components.

Applicants note that:

"[t]he amount of guidance or direction needed to enable the invention is inversely related to the amount of knowledge in the state of the art as well as the predictability in the art. ... The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification." MPEP § 2164.03

In other words:

"[t]he specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public." MPEP § 2164.05

Here, the prior art contains voluminous teachings as to how components in picture data are recognized.

For example, US Patent No. 4,933,865 to Yamamoto et al., which was submitted to the USPTO in Applicants' Information Disclosure Statement (IDS) of January 2, 2001, teaches an apparatus for recognition of shapes in drawings for automatic drawing input in a CAD system. The apparatus includes, among other things, a centerline extraction unit for extracting centerlines drawn in center positions of shapes; a symmetry determination unit for determining the symmetry of shapes; a shape recognition unit for recognizing a shape, a length of a line segment etc; and a character recognition unit for recognizing characters indicating length and angles of contour lines, and the like.¹

In addition, the background section of the '865 patent teaches that automatic drawing input apparatuses are known, which automatically extract characters, symbols, line segments, and other design information from the image data using pattern recognition techniques.²

Next, Applicants point the Examiner to the WIPO reference WO 96/34365, which was also submitted to the USPTO with Applicants' IDS of January 2, 2001. The WO/96/34365 reference teaches that a two-dimensional image (2D) of a three-dimensional object (3D) can be analyzed on a geometric level, wherein "geometric level" means the geometric relation between the locations of features (points, lines) in 3D and their respective location in the 2D image.³ In

¹ See Yamamoto reference, Abstract and col. 2, ln. 60-68

² See Yamamoto reference, ln. 1, col. 19-25

³ See WO 96/34365 reference, page 11, first paragraph

particular, pages 25-45 of the reference describe in great detail algebraic functions that are useful for visual recognition.

As another prior art example, Watanabe et al. (US Patent No. 5,819,016), also submitted to the USPTO with Applicants' IDS of January 2, 2001, teach an arrangement, in which a predicted picture is generated according to a stored model. This picture is then compared with the picture actually taken to detect differences. In the comparison of the pictures, a region of a predicted picture, which corresponds to a small plane of the model, is compared with the picture actually taken. Moreover, in this comparison, the normal direction of the small plane is determined and small planes are selected such that the angle between the normal direction and the direction of view is not greater than the value determined by the user. Furthermore, the domain including the region corresponding to this small plane in the constructed picture is compared with the picture taken.⁴

Watanabe et al. further teach that input pictures are subjected to geometric information extraction by applying fundamental optico-geometric expressions.⁵

Fig. 59 of the Watanabe reference shows a block diagram of a picture comparing section 304. The picture comparing section 304 comprises an angle computing section 309, a comparative region determining section 310, a normal critical value memory 311, and inter-regional operation section 312, and a comparison result memory 313. Fig. 60 shows several processing steps in the picture section 304. Specifics of the different parts of the picture

⁴ See Watanabe reference, col. 5, ln. 13-30

⁵ See Watanabe et al., col. 9, ln. 11-17

comparing section 304, of a difference region finding section 305, and of various processing steps are described in great detail in, e.g., col. 33 and col. 34 of the reference.

In addition, the Arakawa et al. reference (US Patent No. 5,822,450), which is another reference submitted with Applicants' IDS of January 2, 2001, discloses a method for monitoring an equipment state by distribution measurement data. Some of the method steps include: taking in two-dimensional distribution measurement data relating to the state of equipment including the equipment to be monitored; allowing the two-dimensional distribution measurement data and a display result by a three-dimensional shape model of the equipment to be monitored to undergo positioning; and overlaying them in such a manner that they are caused to correspond to each other.⁶

Finally, EP 0 782 100 A2, which was also submitted to the USPTO with Applicants' IDS of January 2, 2001, teaches a three-dimensional shape extraction apparatus and method (see title), in which a unit 543 performs matching processing. Therein, a small region of the object region of an image #1 is extracted as a template, and the extracted template is translated by giving a position offset thereto so as to perform template matching with image data within the range of the possible matching region of an image #2. Thereby, coordinates (x_2 , y_2) of the image #2 are detected that correspond to coordinates (x_1 , y_1) of the image #1.⁷

In other words, as shown by the extensive teachings in the prior art references above, several algorithms, techniques, or processes for comparing and identifying various information

⁶ See Arakawa reference, col. 3, ln. 1-35

⁷ See EP 0782 100 A2, page 7, ln. 1-8

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in picture data are well-known to a person skilled in the art. Therefore, in accordance with MPEP §§ 2164.03 and 2164.05, cited above, Applicants' specification need not disclose these algorithms, techniques or processes in detail. Rather, it suffices for the Applicants to disclose such algorithms, techniques or processes in general terms, as Applicants have done, e.g., on pages 15-18 of the present application.

Consequently, Applicants submit that claims 1-26 are enabled and, thus, respectfully request withdrawal of all claim rejections under 35 U.S.C. § 112, first paragraph.

The Rejection of Claims 1-26 under 35 U.S.C. § 103(a)

Claims 1-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Marks in view of Asar, and further in view of Crandall.

Applicants note that the present application claims priority based on German Application No. 19832974.1 filed on July 22, 1998, and based on US Application No. 09/109,265 filed on June 30, 1998. These two priority documents were submitted to the USPTO on April 26, 2001. Applicants enclose a copy of the filing receipt of April 26, 2001, proving the filing of the two priority documents. Since both of these applications were filed before the filing date of December 11, 1998, of the Asar reference (US Patent No. 6,477,266), the Asar reference is disqualified as prior art.

Applicants also enclose an English translation of the German priority document DE 19832974.1 and an "Affidavit of Accuracy" certifying that this English translation is true and accurate. Thus, Applicants perfect priority based on the German priority document DE 19832974.1.

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For at least these reasons, Applicants respectfully request withdrawal of the rejections of claims 1-26 under 35 U.S.C. § 103(a).

Conclusion:

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. **Since the due date of January 10, 2004 fell on a Saturday, this submission is timely filed.**

Respectfully submitted,

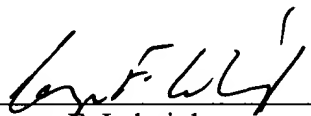
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